



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,348	12/15/2003	Douglas A. Collings	TEC1329	4643
832	7590	10/12/2006		
BAKER & DANIELS LLP 111 E. WAYNE STREET SUITE 800 FORT WAYNE, IN 46802				
EXAMINER DWIVEDI, VIKANSHA S				
ART UNIT		PAPER NUMBER		
3746				

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,348

Applicant(s)

COLLINGS, DOUGLAS A.

Examiner

Vikansha S. Dwivedi

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/15/2003, 9/12/2005, 11/18/2005.

o

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: The locking pin 69 disclosed on page 7, paragraph 20 line 8 is not shown in the drawing.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 lines 9-10 recite, "... the entire cross sectional area of said first cavity portion being in communication with said second cavity portion...". As shown in Figure 2 this condition is not true at all piston positions. In Figure 2 the entire first cavity portion is not in communication with second cavity portion. Applicant needs to provide proper condition for them being in communication, say, position of piston.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 8, 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over S. F. Malaker et al (U.S. Patent number 3,204,864) in view of Schmitz-Montz (U.S. Patent number 4,627,795).

Malaker et al. discloses a design for a piston and its associated cylinder suitable for gas compressors (Column 1 lines 15-17), a cavity (Defined by volume 5 and 12, as shown in Figure 1) having a first cavity portion (5) and a second cavity portion (12), said cavity defining a central axis (Imaginary axis passing through the center of cylinder 3 and 9), extending through each of said first and second cavity portions), said first and second cavity portions respectively having first and second cavity sidewalls (Sidewalls of cylinder 3 and 9) extending substantially parallel to said central axis (Will be parallel to the imaginary axis passing through the center of cylinder 3 and 9), a cross section of said first cavity portion (Cross section taken along the diameter of 3) oriented perpendicular to said central axis defining a first cross sectional configuration and area and a cross section of said second cavity portion (Cross section taken along the diameter of 9) oriented perpendicular to said central axis defining a second cross sectional configuration and area, said second cross sectional area being greater than said first cross sectional area (cross section of diameter of 3 < cross section of diameter of 9), the entire first cross sectional area of said first cavity portion being in communication with said second cavity portion (If the piston can move all the way down then the area defined by 5 and 12 are in communication), and wherein said assembly defines an inlet (7, conduit for gas inlet) in communication with said first cavity portion and a piston (2, working piston) at least partially disposed in

said cavity wherein said piston reciprocates along said central axis, said piston including a first piston portion (2) and a second piston portion (8), said first piston portion having a cross sectional configuration and area substantially similar to said first cavity portion configuration and area (Shown in Figure 1), said second piston portion having a radially outer surface at least partially engageable with said second cavity sidewall (Piston rings 10) and wherein, during reciprocation of said piston within said cavity, said first piston portion compresses a fluid in said first cavity portion and forces transverse to said central axis are transferable between said radially outer surface of said second piston portion and said second cavity sidewall; wherein said first and second cavity portions are each substantially cylindrical (Shown in Figure 1); wherein said first and second cavity portions are coaxially disposed (As explained earlier and apparent from Figure 1); wherein said assembly defines a first clearance distance between said first piston portion and said first cavity sidewall and a second clearance distance between said second piston portion and said second cavity sidewall with said piston centered in said cavity, said first clearance distance being greater than said second clearance distance (It is shown in Figure 1 and becomes clear if one looks at the figure horizontally); further comprising at least one piston ring (10) disposed on said first piston portion wherein said piston ring sealingly engages said first piston portion and said first cavity sidewall ((gas sealing rings, Column 2 lines 24-25); further comprising a motor coupled to said crankshaft and a hermetically sealed housing, said motor, crankshaft, piston and cylinder block being disposed within said housing (Column 1, lines 52-55); wherein said

housing defines an interior volume, said motor and cylinder block disposed within said interior volume, said interior volume containing compressible fluid at a suction pressure;

Malaker et al. does not disclose an outlet in communication with said first cavity; plate defining said inlet and said outlet. Schmitz-Montz discloses a compressor assembly (Invention is piston arrangement for compressor as described in Field of the invention) comprising: a cylinder block (3 and 7), said cylinder block defining a cavity (here the cavity is in two parts that are not disposed right next to each other) having a first cavity portion (defined by cylinder 7) and a second cavity portion (defined by cylinder 3), said cavity defining a central axis (Axis shown by 1a) extending through each of said first and second cavity portions (1a extends through both first and second cavity as shown in Figure 1), said first and second cavity portions respectively having first and second cavity sidewalls extending substantially parallel to said central axis (Shown in Figure 1, walls on either side of piston 4 and 8 respectively are parallel to the central axis 1a), and wherein said assembly defines an inlet (7b as shown in Figure 1) in communication with said first cavity portion and an outlet (7c as shown in Figure 1) in communication with said first cavity portion whereby a compressible fluid enters said first cavity portion through said inlet at a suction pressure and is discharged through said outlet at a discharge pressure; and a piston (1) at least partially disposed in said cavity wherein said piston reciprocates along said central axis; wherein said cylinder block includes a detachable plate defining one

end of said first cavity portion, said plate defining said inlet and said outlet (The top part of Figure 1 shows the plate with inlet and outlet).

With regard to Claim 17, wherein said method further comprises introducing a refrigerant comprising carbon dioxide into said compression chamber and discharging said refrigerant at a supercritical pressure from said compression chamber after compressing the refrigerant with said first piston portion. A recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus that differentiates it from the prior art apparatus satisfying the structural limitations of the claims, as is the case here. MPEP ss 22.251

Malaker et al. sets forth a device as described above, which is substantially analogous to the claimed invention. The Malaker et al. 's device differs from the claimed invention in that there is no explicit teaching of an outlet in communication with said first cavity; plate defining said inlet and said outlet.

Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to modify the Malaker et al. 's device as taught by Schmitz-Montz , in order to advantageously design a compressor assembly that is efficient, can act at high pressure ranges.

Claims 6, 7, 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

No Claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vikansha S. Dwivedi whose telephone number is 571-272-7834. The examiner can normally be reached on M-F, 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 571-272-4444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



VSD



ANTHONY D. STASHICK
PRIMARY EXAMINER